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BOOK REVIEWS

Elements of the Theory of Markov Processes and Their Applications. By A. T. BHARUCHA-REID. McGraw-Hill, New York, 1960. xi + 468 pp. $11.50.

The volume under review is one third devoted to theory and two thirds to applications, the latter including biology (growth of populations), physics (cascade processes, nuclear reactors, counters), astronomy and astrophysics (distribution of the galaxies, radiative transfer), chemistry (reaction kinetics), and the theory of queues (telephone traffic and servicing of machines). There are appendices on generating functions, Laplace and Mellin transforms, and Monte Carlo Methods. Voluminous bibliographies accompany all the discussions. The material should be accessible to anyone who has been through all of W. Feller, *An Introduction to Probability Theory and Its Applications*, Vol. I (Wiley, New York, 1953), where the overlap is to be recommended rather than decried. The spirit of the book is in the direction of applications as is M. S. Bartlett, *An Introduction to Stochastic Processes* (Cambridge Univ. Press, New York, 1955), rather than the more demanding direction of austerity and nicety as in J. L. Doob, *Stochastic Processes* (Wiley, New York 1953), or K. L. Chung, *Markov Chains with Stationary Transition Probabilities* (Springer-Verlag, Berlin, 1960). With this lack of emphasis on foundational matters the interesting current developments tying markov processes to semigroups and potential theory are, in effect, not treated.

Readers of *Information and Control* may be interested in Chapter 9, "The Theory of Queues," which has more material on the subject than P. M. Morse *Queues, Inventories, and Maintenance* (Wiley, New York, 1958), but not the tables of the latter.

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Modern Probability Theory and Its Applications. By EMANUEL PARZEN. Wiley, New York, 1960. xv + 464 pp. $10.75.

Feller's *An Introduction to Probability Theory and Its Applications*, Vol. I, (Wiley, New York 1953) is the appropriate standard, as far as can be judged by frequent references to it, for a good deal of the probability theory which comes up in *Information and Control* and the *IRE Transactions on Information Theory*. The volume under review has a great deal in common with Feller in general philosophy (lots of examples, some of them the same, and problems) and order of presentation (except for some mild permutations). Feller introduces a maximum of probability theory at the expense of limiting himself to discrete sample spaces. Parzen intro-